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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,795	11/13/2003	Jeom-Sik Yang	P2061US	4207
8968	7590	09/30/2005	EXAMINER	
GARDNER CARTON & DOUGLAS LLP ATTN: PATENT DOCKET DEPT. 191 N. WACKER DRIVE, SUITE 3700 CHICAGO, IL 60606			VAN, LUAN V	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 09/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/713,795

Applicant(s)

YANG ET AL.

Examiner

Luan V. Van

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/13/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority*

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). Receipt is acknowledged of papers submitted, which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Dahms '159.

Regarding claims 1, 4 and 5, Dahms '159 teach an electrolyte solution containing sulfuric acid and copper sulfate (column 4 lines 49-60), based on the 1-liter electrolyte solution, comprising: 2-20 mg of bis-w-sulfopropyl-disulfide disodium salt compound (table 2); 5-20000 mg of a poly aklylene glycol-type surfactant (column 3 lines 3-17); and 20-150 mg of chlorine ion (column 4 lines 49-60). These ranges of concentration are within those of the instant claim. With respect to claim 1, using the electrolyte

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solution to manufacture an electrolytic copper foil is an intended use of the instant invention and, thus, is not given patentability weight.

Regarding claim 2, Dahms '159 teach an electrolyte solution containing a dithiocarbamic acid (column 2 lines 64-66).

Regarding claims 6 and 9, Dahms '159 teach an electrolytic method comprising the steps of preparing an electrolyte solution comprising: 2-20 mg/L of bis-w-sulfopropyl-disulfide disodium salt compound (table 2); 5-20000 mg/L of a poly akylene glycol-type surfactant (column 3 lines 3-17); and 20-150 mg/L of chlorine ion (column 4 lines 49-60); and generating the electrolytic copper foil (example 6). The copper foil is inherently deposited on a cathode, since positive metal ions are inherently attracted to the negative electrode, and electrochemical deposition by definition requires electricity to flow between an anode and a cathode through the electrolyte solution.

Regarding claim 7, Dahms '159 teach an electrolytic method containing a dithiocarbamic acid (column 2 lines 64-66).

Claims 1, 3-6 and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Dahms et al. '711.

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Regarding claims 1 and 4-5, Dahms et al. '711 teach an electrolyte solution containing sulfuric acid and copper sulfate (column 8 lines 5-14), based on the 1-liter electrolyte solution, comprising: 0.5-400 mg of bis-w-sulfopropyl-disulfide disodium salt compound (column 8 lines 40-45; table 2); 5-20000 mg of a poly akylene glycol-type surfactant (column 8 lines 40-45; table 1); and 10-180 mg of chlorine ion (column 8 lines 5-14). These ranges of concentration are within those of the instant claim. With respect to claim 1, using the electrolyte solution to manufacture an electrolytic copper foil is an intended use of the instant invention and, thus, is not given patentability weight.

Regarding claim 3, Dahms et al. '711 teach an electrolyte solution containing thiourea derivatives having a concentration of 0.1-500 mg/L (column 9 lines 24-26).

Regarding claims 6 and 9, Dahms et al. '711 teach an electrolytic method comprising the steps of preparing an electrolyte solution comprising: 0.5-400 mg/L of bis-w-sulfopropyl-disulfide disodium salt compound (column 8 lines 40-45; table 2); 5-20000 mg/L of a poly akylene glycol-type surfactant (column 8 lines 40-45; table 1); and 10-180 mg/L of chlorine ion (column 8 lines 5-14); and generating the electrolytic copper foil (example 1). The copper foil is inherently deposited on a cathode, since positive metal ions are inherently attracted to the negative electrode, and electrolytic deposition by definition requires electricity to flow between an anode and a cathode through the electrolyte solution.

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Regarding claim 7, Dahms et al. '711 teach an electrolytic method containing thiourea derivatives having a concentration of 0.1-500 mg/L (column 9 lines 24-26).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3 and 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Dahms '159 in view of Dahms et al. '711 .

Dahms '159 teach the solution and method as described above in addressing claims 1 and 6. The difference between the reference to Dahms '159 and the instant claims is that the reference does not explicitly teach an electrolyte solution containing a thiourea derivative.

Dahms et al. '711 teach an electrolyte solution containing thiourea derivatives having a concentration of 0.1-500 mg/L (column 9 lines 24-26).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the solution and method of Dahms '159 by substituting the nitro compound with the thiourea derivatives of Dahms et al. '711, because using thiourea derivatives for depositing copper would yield a uniform thickness copper coating.

Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahms et al. '711 in view of Dahms '159.

Dahms et al. '711 teach the solution and method as described above in addressing claims 1 and 6. The difference between the reference to Dahms et al. '711 and the instant claims is that the reference does not explicitly teach an electrolyte solution containing a dithiocarbamic acid.

Dahms '159 teach an electrolyte solution containing a dithiocarbamic acid (column 2 lines 64-66) is suitable for depositing copper to yield a shiny and tear-free copper coating.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the solution and method of Dahms et al. '711 by substituting the organic sulfur compound with a dithiocarbamic acid as taught by Dahms '159, because a skilled artisan would be able to select from among known organic sulfur compounds that are suitable for depositing copper, and because using a dithiocarbamic acid for depositing copper would yield a shiny and tear-free copper coating.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure. Dahms '582, Clouser et al., and Gabe et al. teach an electrolytic solution and method of manufacturing a copper foil. Rao et al. also teach an electrolytic solution and method for depositing copper using a bis-3-sulfopropyl-disulfide disodium salt compound.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan V. Van whose telephone number is 571-272-8521. The examiner can normally be reached on M-F 8:30-5:00.

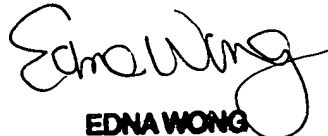
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LVV  
9/22/05

  
**EDNA WONG**  
**PRIMARY EXAMINER**